IN THE CLAIMS

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1. (Previously Presented) A method of sending an original information sequence, including:

an encoding operation, of encoding the original information sequence by means of an error correction code, so as to obtain a sequence of encoded symbols;

a frequency mapping operation, of associating with the sequence of encoded symbols K frequency symbols in a frequency space consisting of an ordered series of 2^p increasing frequencies, periodically spaced apart and associated with an amplitude, each of the K frequency symbols representing N encoded symbols, p, K and N being strictly positive integers;

an inverse transformation operation, of applying to the K frequency symbols a reversible transformation including a multiplication by an invertible matrix of size NxN, so as to obtain inverse transform signals; and

a transmission operation, of sending over a transmission channel signals obtained from the inverse transform signals in which there exists a K-tuplet of positive integers $n_1, n_2, ..., n_K$, at least one of which is strictly positive, such that, for an integer i varying from 1 to K, after periodic extraction of one frequency out of 2^{ni} amongst the frequencies of the i^{th} of the K frequency symbols, thus forming a reduced frequency

symbol with 2^{p-ni} frequencies, a set of K reduced frequency symbols is obtained, representing the original information sequence, with a view to a complete or partial decoding.

2. (Previously Presented) The method according to Claim 1, in which there exists a strictly positive integer n such that, after periodic extraction of one frequency out of 2^n amongst the frequencies of each of the K frequency symbols, thus forming a reduced frequency symbol with 2^{p-n} frequencies, there is obtained a set of K reduced frequency symbols representing the original information sequence.

3. (Currently Amended) The method according to Claim 1 or 2, characterised in that said encoding operation [[(El)]] includes at least one systematic recursive convolutional encoding operation.

4. (Previously Presented) The method according to Claim 1 or 2, in which said encoding operation is a turbo-encoding operation.

5. (Previously Presented) The method according to Claim 1 or 2, in which said reverse transformation operation is an inverse fast discrete Fourier transformation operation.

6. (Previously Presented) The method according to Claim 1 or 2, in which the original information sequence has a length ℓ, in which a value of N is chosen which is both a power of 2 and equal to 4ℓ.

7. (Previously Presented) The method according to Claim 1 or 2, in which said encoding operation is a turbo-encoding operation with two parities and, during said frequency mapping operation, for each block of four successive frequencies, corresponding respectively to four sub-carriers:

a systematic output (x) obtained at the end of the turbo-encoding operation is associated with a first available sub-carrier, in the sense of the lowest frequency in the block;

an output with a second parity (y2) obtained at the end of the turbo-encoding operation is associated with a second sub-carrier in the block;

an output with a first parity (y1) obtained at the end of the turbo-encoding operation is associated with a third sub-carrier in the block; and

the systematic output (x) is also associated with a fourth available sub-carrier, in the sense of the highest frequency in the block.

8. (Previously Presented) The method according to Claim 1 or 2, in which said encoding operation is a turbo-encoding operation with three parities and, during said frequency mapping operation, for each block of four successive frequencies, corresponding respectively to four sub-carriers:

a systematic output (x) obtained at the end of the turbo-encoding operation is associated with a first available sub-carrier, in the sense of the lowest frequency in the block;

an output with a second parity (y2) obtained at the end of the turbo-encoding operation is associated with a second sub-carrier in the block;

an output with the first parity (y1) obtained at the end of the turbo-encoding operation is associated with a third sub-carrier in the block; and

an output with a third parity (y3) obtained at the end of the turbo-encoding operation is associated with a fourth available sub-carrier, in the sense of the highest frequency in the block.

9. (Previously Presented) The method according to Claim 1 or 2, in which a modulation of the OFDM type is used.

10. (Currently Amended) A device for sending an original information sequence, having:

encoding means, for encoding the original information sequence by means of an error correction code, so as to obtain a sequence of coded symbols;

frequency mapping means, for associating with the sequence of encoded symbols K frequency symbols in a frequency space consisting of an ordered sequence of 2^p increasing frequencies periodically spaced apart and associated with an

amplitude, each of the K frequency symbols representing N encoded symbols, p, K and N being strictly positive integers;

inverse transformation means, for applying to the K frequency symbols a reversible transformation including a multiplication by an invertible matrix with a size NxN, so as to obtain inverse transform signals; and

transmission means, for sending over a transmission channel signals obtained from the inverse transform signals in which there exists a K-tuplet of positive integers n_1, n_2, ..., n_K, at least one of which is strictly positive, such that, for an integer i varying from 1 to K, after periodic extraction of one frequency out of 2^{ni} amongst the frequencies of the i^{th} of the K frequency symbols, thus forming a reduced frequency symbol with [[2]] $\underline{2^{p-ni}}$ [[P^{p-ni}]] frequencies, a set of K reduced frequency symbols is obtained, representing the original information sequence, with a view to a complete or partial decoding.

11. (Previously Presented) The device according to Claim 10, in which there exists a strictly positive integer n such that, after periodic extraction of one frequency out of 2^n amongst the frequencies of each of the K frequency symbols, thus forming a reduced frequency symbol with 2^{p-n} frequencies, there is obtained a set of K reduced frequency symbols representing the original information sequence.

12. (Previously Presented) The device according to Claim 10 or 11, in which said encoding means includes at least first systematic recursive convolutional encoding means.

13. (Previously Presented) The device according to Claim 10 or 11, in which said encoding means comprises turbo-encoding means.

14. (Previously Presented) The device according to Claim 10 or 11, in which said reverse transformation means comprises inverse fast discrete Fourier transformation means.

15. (Previously Presented) The device according to Claim 10 or 11, in which the original information sequence has a length ℓ, characterised in that, for said predetermined number (N), a value is chosen which is both a power of 2 and equal to 4ℓ.

16. (Previously Presented) The device according to Claim 10 or 11, in which said encoding means comprise turbo-encoding means with two parities and said frequency mapping means associate, for each block of four successive frequencies, corresponding respectively to four sub-carriers:

a systematic output (x) of said turbo-encoding means with a first available sub-carrier, in the sense of the lowest frequency in the block;

an output with a second parity (y2) of said turbo-encoding means with a second sub-carrier in the block;

an output with a first parity (y1) of said turbo-encoding means with a third sub-carrier in the block; and

the systematic output (x) also with a fourth available sub-carrier, in the sense of the highest frequency in the block.

17. (Previously Presented) The device according to Claim 10 or 11, in which said encoding means comprises turbo-encoding means with three parities and said frequency mapping means associates, for each block of four frequencies, corresponding respectively to four sub-carriers:

a systematic output (x) of said turbo-encoding means with a first available sub-carrier, in the sense of the lowest frequency in the block;

an output with a second parity (y2) of said turbo-encoding means with a second sub-carrier in the block;

an output with a first parity (y1) of said turbo-encoding means with a third sub-carrier in the block; and

an output with a third parity (y3) of said turbo-encoding means with a fourth available sub-carrier, in the sense of the highest frequency in the block.

18. (Previously Presented) The device according to Claim 10 or 11, in which a modulation of the OFDM type is used.

19. (Previously Presented) A method of receiving signals representing an original information sequence sent by means of a transmission method according to Claim 1 or 2, in which, from a K-tuplet of granularity equal to positive integers $n'_1, n'_2, ..., n'_K$ such that each integer n'_i is less than or equal to the integer n_i, said reception method includes:

an operation, of receiving the K frequency symbols sent by means of said transmission method;

an extraction operation, for each integer i varying from 1 to K, of periodically extracting one frequency out of $2^{n'i}$ amongst the frequencies of the i^{th} of the K frequency symbols received, thus forming a reduced frequency symbol with $2^{p-n'i}$ frequencies;

a transformation operation, for each integer i varying from 1 to K, of applying to the reduced frequency symbol with $2^{p-n'i}$ frequencies, a reversible transformation including a multiplication by an invertible matrix of size $2^{p-n'} \times 2^{p-n'}$; and

an operation, of decoding all the K reduced frequency symbols with $2^{p-n'i}$ frequencies, thus forming a decoded information sequence.

20. (Previously Presented) The reception method according to Claim 19, in which the K-tuplet of granularity is determined during a choosing operation.

21. (Previously Presented) The reception method according to Claim 19, the original information sequence having been sent by means of a sending method

according to Claim 2, in which, from a granularity equal to a positive integer n' less than or equal to said integer n, said reception method includes:

an operation, of receiving K frequency symbols sent by means of said transmission method;

an extraction operation, of periodically extracting one sequence out of $2^{n'}$ amongst the frequencies of each of the K frequency symbols received, thus forming a reduced frequency symbol with $2^{p-n'}$ frequencies;

a transformation operation, of applying, to each of the K reduced frequency symbols with $2^{p-n'}$ frequencies, a reversible transformation including a multiplication by an invertible matrix of size $2^{p-n'} \times 2^{p-n'}$; and

an operation, of decoding all the K reduced frequency symbols with $2^{p-n'}$ frequencies, thus forming a decoded information sequence.

22. (Previously Presented) The reception method according to Claim 21, in which said granularity is determined during a choosing operation.

23. (Previously Presented) The reception method according to Claim 20, in which said choosing operation includes choosing said granularity so as to be the greater, the better the reception quality.

24. (Previously Presented) The reception method according to Claim 20, in which said choosing operation includes choosing said granularity from a look-up table giving possible granularity values as a function of signal to noise ratios.

25. (Canceled)

26. (Previously Presented) The reception method according to Claim 19, in which said transformation operation is a direct fast discrete Fourier transformation operation.

27. (Previously Presented) The reception method according to Claim 19, in which said decoding operation includes decoding the set of reduced frequency symbols according to a decoding technique which is a function of said granularity.

28. (Previously Presented) The reception method according to Claim 19, in which said decoding operation is a turbo-decoding operation.

29. (Previously Presented) The reception method according to Claim 19, in which said decoding operation is a Viterbi decoding operation.

30. (Previously Presented) The reception method according to Claim 19, in which said decoding operation is a threshold decoding operation.

31. (Previously Presented) A device for receiving signals representing an original information sequence sent by a sending device according to Claim 10 or 11, in which, from a K-tuplet of granularity equal to positive integers n'_1, n'_2, ..., n'_K such that each integer n'_i is less than or equal to the integer n_i, said reception device has:

transformation means, for applying, for each integer i varying from I to K, to the reduced frequency symbol with $2^{p-n'i}$ frequencies, a reversible transformation including a multiplication by an invertible matrix of size $2^{p-n'i}$ x $2^{p-n'i}$; and

decoding means for decoding all the K reduced frequency symbols with $2^{p-n'i}$ frequencies, thus forming a decoded information sequence.

32. (Previously Presented) The device according to Claim 31, in which said K-tuplet of granularity is determined using choosing means.

33. and 34. (Canceled)

35. (Previously Presented) The device according to Claim 32, in which said choosing means choose said granularity so as to be the greater, the better the reception quality.

36. (Previously Presented) The device according to Claim 32, in which said choosing means choose said granularity from a look-up table giving possible granularity values as a function of signal to noise ratios.

37. (Previously Presented) The device according to Claim 32, in which said choosing means choose said granularity from a look-up table giving possible granularity values as a function of a distance between a sender having a sending device according to any one of Claims 10 to 18 and a receiver having said reception device.

38. (Previously Presented) The device according to Claim 31, in which said transformation means comprise direct fast discrete Fourier transformation means.

39. (Previously Presented) The device according to Claim 31, in which said decoding means decode the set of reduced frequency symbols according to a decoding technique which is a function of said granularity.

40. (Previously Presented) The device according to Claim 31, in which said decoding means comprise turbo-decoding means.

41. (Previously Presented) The device according to Claim 31, in which said decoding means comprise Viterbi decoding means.

42. (Previously Presented) The device according to Claim 31, in which said decoding means comprise threshold decoding means.

43. (Previously Presented) A digital signal processing apparatus, having means adapted to implement a sending method according to Claim 1 or 2.

44. (Previously Presented) A digital signal processing apparatus, having means adapted to implement a reception method according to Claim 19.

45. (Previously Presented) A digital signal processing apparatus, having a sending device according to Claim 10 or 11.

46. (Previously Presented) A digital signal processing apparatus, having a reception device according to Claim 31.

47. (Previously Presented) A telecommunications network, having means adapted to implement a sending method according to Claim 1 or 2.

48. (Previously Presented) A telecommunications network, having means adapted to implement a reception method according to Claim 19.

49. (Previously Presented) A telecommunications network, having a sending device according to Claim 10 or 11.

50. (Previously Presented) A telecommunications network, having an information reception device according to Claim 31.

51. (Previously Presented) A mobile station in a telecommunications network, having means adapted to implement a sending method according to Claim 1 or 2.

52. (Previously Presented) A mobile station in a telecommunications network, having means adapted to implement a reception method according to Claim 19.

53. (Previously Presented) A mobile station in a telecommunications network, having a sending device according to Claim 10 or 11.

54. (Previously Presented) A mobile station in a telecommunications network, having a reception device according to Claim 31.

55. (Previously Presented) Information storage means which can be read by a computer or microprocessor storing instructions of a computer program, in which said information storage means implements a sending method according to Claim 1 or 2.

56. (Previously Presented) Information storage means which can be read by a computer or microprocessor storing instructions of a computer program, in which said information storage means implements a reception method according to Claim 19.

57. (Previously Presented) Information storage means which is removable, partially or totally, and which can be read by a computer or microprocessor storing instructions of a computer program, in which said information storage means implements a sending method according to Claim 1 or 2.

58. (Previously Presented) Information storage means which is removable, partially or totally, and which can be read by a computer or microprocessor storing instructions of a computer program, in which said information storage means implements a reception method according to Claim 19.

59. (Previously Presented) A computer program product, comprising software code portions for implementing a sending method according to Claim 1 or 2.

60. (Previously Presented) A computer program product, comprising software code portions for implementing a reception method according to Claim 19.

61. (Previously Presented) A method for communicating, on a transmission channel, signals representing an original information sequence, the method comprising:

sending the original information sequence, including:

an encoding operation, of encoding the original information sequence by means of an error correction code, so as to obtain a sequence of encoded symbols,

a frequency mapping operation, of associating with the sequence of encoded symbols K frequency symbols in a frequency space consisting of an ordered series of 2^p increasing frequencies, periodically spaced apart and associated with an amplitude, each of the K frequency symbols representing N encoded symbols, p, K and N being strictly positive integers,

an inverse transformation operation, of applying to the K frequency symbols a reversible transformation including a multiplication by an invertible matrix of size NxN, so as to obtain inverse transform signals, and

a transmission operation, of sending over a transmission channel signals obtained from the inverse transform signals in which there exists a K-tuplet of positive integers $n_1, n_2, ..., n_K$, at least one of which is strictly positive, such that, for an integer i varying from 1 to K, after periodic extraction of one frequency out of 2^{ni} amongst the frequencies of the i^{th} of the K frequency symbols, thus forming a reduced frequency symbol with 2^{p-ni} frequencies, a set of K reduced frequency symbols is obtained, representing the original information sequence, with a view to a complete or partial decoding; and

receiving the signals representing the original information sequence sent by said sending, in which, from a K-tuplet of granularity equal to positive integers $n'_1, n'_2, ..., n'_K$ such that each integer n'_i is less than or equal to the integer n_i, said method includes:

an operation, of receiving the K frequency symbols sent by said sending,

an extraction operation, for each integer i varying from 1 to K, of periodically extracting one frequency out of $2^{n'i}$ amongst the frequencies of the i^{th} of the K frequency symbols received, thus forming a reduced frequency symbol with $2^{p-n'i}$ frequencies,

a transformation operation, for each integer i varying from 1 to K, of applying to the reduced frequency symbol with $2^{p-n'i}$ frequencies, a reversible transformation including a multiplication by an invertible matrix of size $2^{p-n'} \times 2^{p-n'}$, and

an operation, of decoding all the K reduced frequency symbols with $2^{p-n'i}$ frequencies, thus forming a decoded information sequence.